

FIGURE 20. Panel A, a 1998 aerial photograph, shows the vulnerable barrier island segment near Hatteras Village. The 1860 show the extent of island narrowing over 138 years. Panel B is a September 2003 aerial photograph of the newly formed Isabel Inlet through that segment. An inlet at such a location, if allowed to develop, would build sound-side shoals which would widen the island segment, once the inlet closes. Panel C shows marsh formed on the sound side of the barrier when the ocean shoreline was substantially seaward of its present location. The presence of peat at the location indicated by red stars reduced the likelihood of inlet formation at that site. Panel D shows NC Highway 12 "going-to-sea" following Hurricane Isabel. The location of the north eastern margin of the inlet is indicated by the green stars. Panel C and D photographs are by S. Riggs.

## Inlet Openings and Closings

Hurricane Isabel came ashore in the vicinity of Ocracoke Inlet on September 18, 2003. This small storm produced Isabel Inlet in a low and narrow portion of the barrier adjacent to Hatteras Village (Fig. 20). Two other weak spots (on the northeast end of Ocracoke Island and at the 1962 Buxton Inlet site) came close to forming inlets. Isabel Inlet was subsequently closed within five weeks utilizing sand from the dredged navigation channel for the Hatteras-Ocracoke ferry. This extremely narrow island segment, however, needed a flood-tide delta and its sand deposits to develop island width. This island segment is as vulnerable to inlet formation now as it was prior to Hurricane Isabel. In fact, there are several locations along the North Carolina coast where new inlets could open during a future storm. Using digital elevation data along the Outer

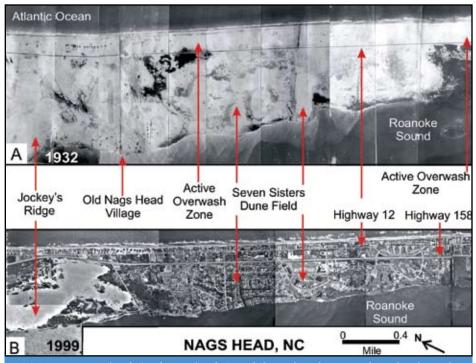


FIGURE 21. 1932 (Panel A) and 1999 (Panel B) aerial photographs of the Nags Head area show the growth of Old Nags Head village from the shores of Roanoke Sound to the ocean front. Notice the substantial decrease in the distance from the shoreline to NC Highway 12 from 1932 to 1999. The 19th century ocean-front houses have been moved westward several times in response to shoreline recession. Notice that most of the land and dune fields have been urbanized since 1932. Figure is modified from Riggs and Ames (2003).